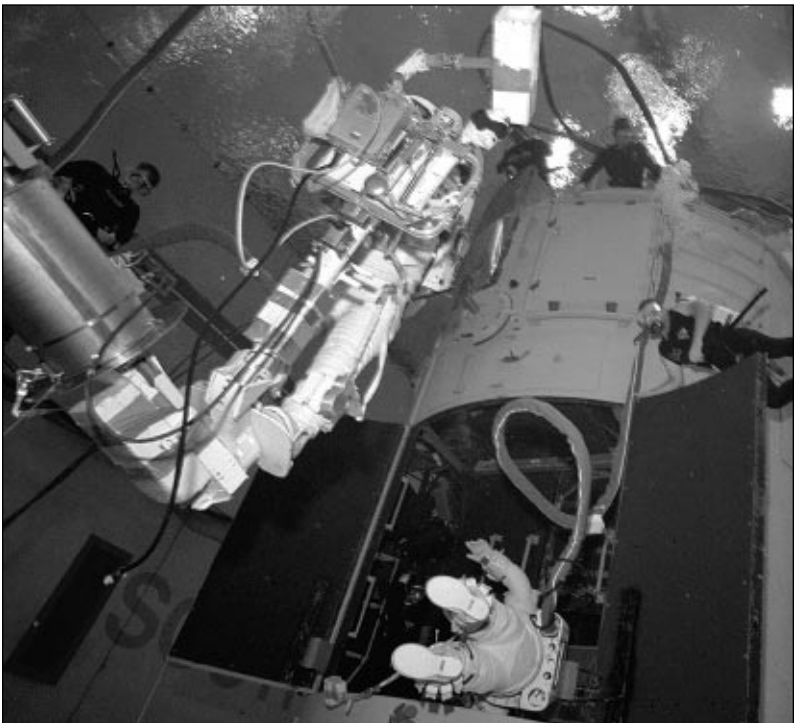


From top to bottom: 1) In the new Neutral Buoyancy Laboratory at the Sonny Carter Training Facility the STS-82 astronauts practiced the procedures they will use during their space walks when servicing the Hubble Space Telescope. 2) Payload Commander Mark Lee practices installing a unit similar to the Space Telescope Imaging Spectrograph and the Near Infrared Camera and Multi-Object Spectrometer, or NICMOS. 3) Astronaut Jeff Hoffman, on the robot arm, helps train Lee on installation and connection procedures. This box is similar to the type of box that Story Musgrave changed out on STS-61, only more user friendly. It has a number of deconnectors and the challenge for the astronauts is to move each connectors and mate it up with a connector keeper on the new box without losing the little screws. 4) Before the astronauts can install the new instruments, they must remove them from their stored position, in *Discovery's* cargo bay. Tanner shows Lee how best to handle the unpacking of the instruments.

JSC Photos By Robert Markowitz



Space Service

Four mechanics give Hubble 450 million mile service check

By Karen Schmidt

A crew of seven are scheduled to set out on a journey this week to help expand the knowledge of what lays beyond Earth's own galaxy.

The Hubble Space Telescope once again will be captured by astronauts and refurbished to extend the orbiting telescope's life and enhance its capabilities.

"The prime goal of this second servicing mission is a major upgrade and an extension of the science on Hubble," said Ed Weiler, chief scientist for Hubble. "We are replacing 1970s technology in our science instruments with 1990s technology."

In four space walks Mission Specialists Mark Lee, Greg Harbaugh, Steve Smith and Joe Tanner will remove two older astronomy instruments and install new ones. The Near Infrared Camera and Multi-Object Spectrometer, or NICMOS, will improve how astronomers determine distance to galaxies and provide images of star formation and obscured galactic centers.

"The NICMOS will provide images of the near infrared for the first time. It will fill the gap between Hubble's capabilities and the capabilities on the Space Infrared Telescope Facility, the last of the great observatories, to be launched in 2002," said Weiler. "For the first time we will have the capability to observe the universe all the way from the ultraviolet with Hubble through the mid and far infrared with SIRTf."

The Space Telescope Imaging Spectrograph will provide a new two-dimensional capability to Hubble's spectroscopy. This new spectrograph also will cover a broader wavelength range and has improved sensitivity. Hubble also will receive a refurbished guidance sensor, a new pointing device and service to its support systems and new recorders.

Commander Ken Bowersox, Pilot Scott Horowitz, Mission Specialist Steve Hawley and space walkers Lee, Smith, Tanner and Harbaugh have trained long hours to service Hubble.

Once Bowersox and Horowitz maneuver *Discovery* into place, Hawley is scheduled to use the robot arm Thursday to grapple and berth Hubble in the cargo bay.

Space-walking activities were scheduled to begin today with Lee and Smith.

"Once we berth the Hubble Space Telescope, on its berthing and positioning ring we are going to put in a stem that goes from the bottom of the flight servicing structure up to the ring that rotates to give a little more rigidity to the whole structure," Lee said. "This is our opportunity to make sure we have a real steady platform to work from. Once we do that, we will do a lot of other initial setups."

After Lee and Smith set up the cargo bay, the two space walkers will remove the Goddard High Resolution Spectrometer and

replace it with the Space Telescope Imaging Spectrograph. Next, the team will focus on removal of the Faint Object Spectrograph and will install the NICMOS.

"That will take up most of day one. If we get a little bit ahead, we hope to move up the reaction wheel assembly. The more we can get done on days one and two, the less filled days three and four will be. It will give us a little more margin," Lee added.

On flight day five, Harbaugh and Tanner will emerge from *Discovery's* airlock to begin their work on the replacement of the fine guidance sensor, the engineering/science tape recorder and the optical control electronics enhancement kit.

"I will be on the end of the arm and Greg will be the free-floater," said Tanner. "He does the connectors and provides clearance for me and I get to demate the latch that holds the FGS in place and handle the mass. After we finish that task, we will go in and replace the tape recorder. We will then swap positions and Greg will get on the end of the arm and I will be the free-floater. Greg will install an enhancement kit for the optical control electronics."

With the work half over, Lee and Smith will emerge for a third space walk. Smith will be the free-floater and retrieve the data interface unit from a storage box in *Discovery's* cargo bay and hand the unit to Lee for installation into Hubble.

"The unit Mark will take out has about 20 connectors," said Smith. "So, we think it will be one of the more difficult hand intensive tasks we have to do."

Smith and Lee once again will switch places and replace another tape recorder with a new solid state recorder. If Smith and Lee were unable to install the reaction wheel assembly on their first space walk, they will complete that task before moving on to replace Magnetic Sensing System covers.

"That task is near the top of the telescope and it is a task we all look forward to doing, so if we don't do it on day three, Greg and Joe will do it on day four," he added.

The final space walk of the mission will replace Hubble's solar array drive electronics box. This box helps control the movement of the solar arrays on the telescope.

"It is the same type of box that Story Musgrave changed out on STS-61, only this time around we think we've got it engineered a little bit more user friendly," Harbaugh said. "It has a number of deconnectors. The challenge is going to be for Joe and me to move each of those connectors and mate it up with a connector keeper on the new box without losing those little screws."

Once work is complete Hawley will deploy the telescope into space where it can continue to explore the mysteries of the universe.

Discovery is scheduled to return in the wee hours of Feb. 21. □

